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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/680,256	10/08/2003	Kyojiro Nanbu	243490US-2S CONT	5662

22850 7590 01/23/2007
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ALEXANDRIA, VA 22314

EXAMINER

LE, BRIAN Q

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/680,256

Applicant(s)

NANBU, KYOJIRO

Examiner

Brian Q. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/8/03;10/11/05</u> . | 6) <input type="checkbox"/> Other: _____ |

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-14 in the reply filed on 11/13/2006 is acknowledged. The traversal is on the ground(s) that the search and examination of an entire application can be made without serious burden even though it includes claims to distinct or independent inventions since electronic searching is commonly performed, a search may be made of a large number of subclasses without substantial additional effort. This is not found persuasive because the MPEP has no provision of whether electronic searching eliminates substantial addition effort. Also the exponential growth of patent publication, a sub-class may consist of several thousands of patents. The Examiner may have to search through all the patents in each subclass to look for a specific claimed limitation.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claims 5, 8 and 10 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claims 1-4, and 6-8. See MPEP § 608.01(n). Accordingly, the claims 5, 8 and 10 have not been further treated on the merits.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the

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specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Regarding claim 14, the original disclosure does not show the support of how the limitation “average means for averaging values of the first pixel and the second pixel when the numerical similarity is high in the numerical means, and for not averaging the first pixel value and the second pixel value when the determined similarity is low” is made. The information contained in the disclosure of the application is insufficient to inform one skilled in the art to know how to both make and use the claimed invention.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 6-7, and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Mancuso U.S. Patent No. 6,108,455.

Regarding claim 1, Mancuso teaches an image processing apparatus (method of reducing noise in the image) (abstract) comprising:

Decision means for deciding a similarity between a first pixel and a second pixel which constitute an image (determine a similarity between target pixel and neighboring pixels) (abstract), by testing (by the computation and image processing) (abstract); and

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Average means for subjecting the first pixel and the second pixel to weighted averaging on the basis of a decided result by the decision means (column 4, lines 44-64).

Regarding claim 2, Mancuso further teaches an image processing apparatus comprising:

Numerical means for giving a weight which is determined by a similarity between a first pixel and a second pixel constituting an image (generate metric K_n of pixels) (column 3, lines 55-60 and column 6, lines 50-54); and

Average means for subjecting values of the first pixel and the second pixel to weighted averaging by using the weight numerically given (column 4, lines 44-64).

For claim 3, Mancuso also teaches an image processing apparatus wherein the average means obtains a new pixel value concerning the first pixel, as a weighted average (weighted average of target pixel as a membership function) (column 4, 44-64).

Referring to claim 6, Mancuso discloses an image processing apparatus wherein the decision means decides the similarity between the first pixel and the second pixel (please refer back to claims 1-3 for teachings) on the basis of a plurality of images obtained in such a way that an identical subject is photographed at different times (video image sequences being recorded at different times) (column 2, line 45) by employing an imaging equipment (image processor) (column 7, line 28).

For claim 7, Mancuso also discloses an image processing apparatus wherein the decision means decides the similarity between the first pixel and the second pixel on the basis of a plurality of images obtained in such a way that an identical subject is photographed at different photographing conditions by employing an imaging equipment (photograph as video sequences

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taking at different photographing conditions as different times/different signal processing frequency) (column 2, lines 38-45).

For claim 11, Mancuso teaches an image processing apparatus further comprising image average means for averaging a first image obtained by subjecting the image to averaging processing with the average means (average the target pixel of the image) (column 4, lines 55-60), and a second image obtained by subjecting the image to processing different from the averaging processing (compress the image) (column 5, lines 30-35).

Regarding claim 12, Mancuso teaches image processing further comprising image average means for averaging a first image subjected to averaging processing by the average means (average the first image, including target and neighbor pixels) (column 4, lines 55-60), and a second image before subjecting the first image to the averaging processing (average second image of sequentially input images) (column 4, lines 55-60).

For claim 13, please refer back to claim 2 for further teachings and explanations.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mancuso U.S.

Patent No. 6,108,455 as applied to claim 1 above, and further in view of Qian et al. U.S. Patent No. 6,195,450.

Regarding claim 4, as discussed in previous claims, Mancuso teaches an image processing apparatus wherein the average means includes determination means for determining the weighting factor on the basis of the decided result (column 4, lines 44-64). Mancuso does not explicitly teach a multiplication means for multiplying values of the first pixel and the second pixel by the weighting factor. Qian further teaches an image processing wherein comprises a multiplication means for multiplying values of the first pixel and the second pixel by the weighting factor (column 12, lines 18-22). Modifying Mancuso's method of image processing according to Qian would be able to scale pixels with a factor so that pixels corresponding to relative small values can have similar values to pixels' large values for further analysis (column 3, lines 24-30). This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Mancuso according to Qian.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mancuso U.S. Patent No. 6,108,455 as applied to claim 1 above, and further in view of Chaddha U.S. Patent No. 6,360,019.

Regarding claim 9, Mancuso teaches the decision means decides the similarity between the first pixel and the second pixel in single image obtained by photographing with an image equipment (as explained in previous claims) (column 2, lines 40-50; column 7, lines 25-30). Mancuso does not explicitly teach the decision means wherein decides the similarity between the first pixel and the second pixel by using a result of a comparison which is made between a vector value constructed by arraying scalar values of the first pixel in a single image obtained by photographing a subject with an imaging equipment, and a vector value constructed by arraying scalar values of the second pixel. Chaddha teaches an image processing (abstract) that takes

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input images/process image (column 5, lines 54-59) wherein teaches a decision means to decides the similarity (matching and classifying pixels) (column 9, lines 1-40) between the first pixel (left pixel) (column 9, lines 1-40) and the second pixel (right pixel) (column 9, lines 1-40) by using a result of a comparison which is made between a vector value (column 9, lines 14-18) constructed by arraying scalar values (column 11, lines 19-24) of the first pixel in a single image obtained by photographing a subject with an imaging equipment, and a vector value constructed by arraying scalar values of the second pixel (column 11, lines 19-24 and column 12, lines 45-54). Modifying Mancuso's method of processing image according to Chaddha would be able to utilize vector and scalar values in deciding similarity of pixels. This would improve processing because it would create a codebook so that the matching and comparing pixels can be pre-computed and can be easily mapped (column 4, lines 28-55) and therefore, it would have been obvious to one of the ordinary skill in the art to modify Mancuso according to Chaddha.

Allowable Subject Matter

10. Claim 14 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 1st paragraph, set forth in this Office action.

CONCLUSION

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to pixel similarity analysis and template matching:

U.S. Pat. No. 6,067,371 to Gouge et al., teaches method and system for non-invasive temperature mapping of tissue.

U.S. Pat. No. 5,754,707 to Knowlton, teaches image undithering apparatus and method.

U.S. Pat. No. 6,360,019 to Chaddha, teaches table-based compression with embedded coding.

U.S. Pat. No. 6,195,450 to Qian et al., teaches methods and apparatus for controlling x-ray angiographic image acquisition.

U.S. Pat. No. 6,952,484 to Higginbottom et al., teaches method and apparatus for mark detection.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q. Le whose telephone number is 571-272-7424. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mathew Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Brian Le
January 17, 2007